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HUMORAL PATHOLOGY.

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To the Editor of the Boston Medical and Surgical Journal.

SIR,—The paucity of communications to your Journal from the physicians of Boston, where so much of talent, erudition and opportunity exist, has repeatedly excited my surprise. The congregation of singular, difficult, and interesting cases in a city of 70,000 inhabitants, with such of a like kind as may come from all parts of the country, would seem to afford a never-failing source for the acute eye to observe, for the profound mind to systematize, and for the pen of industry and genius to portray. And to these prolific sources the hospitals are to be added, where, as we suppose, patients coming by sea, from other parts of the world, are occasionally to be seen.

Every era seems to have had its *fixtures*, except the present; but now everything is afloat. We want a high *medical court of appeals*, to which to carry up contested points of medical jurisprudence and other matters; and by which medical errors, and medical heresies, may be prostrated, and the great fundamental truths established. We want to see such a court erected in, and by, the professors and physicians of the METROPOLIS OF NEW ENGLAND. It is there that talents, and opportunities, and resources, are ample. Meantime, your already very interesting weekly Journal would become still more valuable, by becoming the organ in which the results were given to the medical public.

It is not a collection alone of rare and unparalleled cases, which may have happened once but which may never happen again, that the present writer has in view. These, to be sure, are matters of curiosity and interest, but often of little real utility. But the ascertaining and deciding of those principles, and doctrines, and practical points, which have a bearing upon all time, and all space, how all-important! It is the fixture of great paramount principles, on a basis sure, stationary, and stedfast, to which, as to an *ancora sacra*, all may appeal, that we aim.

It is a trait of the human character, and much, very much, to be deprecated, that when *truth* becomes *old-fashioned*, it is liable to *go out of fashion*. Hence, the introduction of the *ultra-stimulant* practice by BROWN, because the depletory and cooling practice of SYDENHAM had become stale. And hence the *ultra-depletory* practice of RUSH and ARMSTRONG, because that of BROWN and DARWIN had done mischief by being carried to excess; or, that it was thought that a *new fashion* would procure immortality for its authors. So the *solid* pathology of CULLEN, HOFFMAN, and HALLER, was reared against the *humoral* *pathology* of all past, present, and it is presumed *future* time. And we come now to the case which we wish to carry up to our high medical court. And as it is one, in our view, of some importance, we shall enter it, with at *least a part* of our *pleadings*.

When the humoral matter of smallpox, of chancre, and of gonorrhœa, conveys each its primary and specific disease, the humoral pathology would seem to have its claims pretty firmly fixed. When intemperance in spirituous potations deteriorates the fluids and fills the vessels with ruined blood, sometimes of such an inflammatory nature that spontaneous combustion ensues, the mischief and misery are referred to the humors. When drinking cold water in certain states of the *primæ viæ*, suddenly kills; when extravasations on the brain produce apoplexy and palsy; when effusions of serum, or lack of absorption, causes dropsy; and when the injection of the mildest fluids into the veins has proved fatal, the humoral pathology receives powerful support.

When the perspiration is checked by cold, we have catarrhs, coryzes, fevers, pneumonies, consumption, amenorrhœa, and a train of other maladies, all owing to humors suppressed, misplaced, or vitiated. In phthisis, we find the only certain criterion, the only infallible diagnostic, in the expectoration and symptoms of absorption of purulent humors; whilst *post-mortem* dissection exhibits the lungs containing, and a part of their substance changed into, the same destructive fluid.

No causes of disease are more apparent than those arising from suppression of urine, and its extravasation—to retained catamenia, to checked lochia, and to retropulsed blenorrhagia; all pointing to the humoral pathology.

Bloodletting is founded upon the same pathology. We do not bleed unless we find that our patient has too much blood, or that it is in a state of inflammation, congestion, engorgement, or *error loci*.

Respiration illustrates the humoral pathology. The air admitted into the lungs, is a fluid. It renovates another fluid already there, viz. the blood. It carries off other fluids, pernicious, when too abundant, i. e. nitrogen and carbon. Death, or at least its proximate cause, even in hanging and drowning, is owing to the retention of one or both of these fluid principles, by which the whole arterial blood in the brain and in the lungs becomes venous, and totally unfit to support life.

Poisons, whether animal, vegetable, or mineral, must be rendered fluid, either by action, solution, or mixture, before they can take effect. When nature removes the cause of diseases by critical evacuations, these are in a liquid form, showing that the cause was humoral.

We have in view, crises by hemorrhage, by urine, by diarrhœa, by sudoresis, by expectoration, by lochia, by catamenia, by the matter of abscess, and by salivation. We once had a noticeable spontaneous case of the latter, in a man of about 45, who recovered from a typhous pneumonia by spitting upwards of a quart a day.—The blood receives no supplies from solid aliment, by way of the lacteals and thoracic duct, until it becomes liquid.

Thus life, health, the nourishment of the body, sanguification, diseases and death, depend upon liquids.

Now against the humoral pathology there stand arrayed *three words*;

these are, the *primary moving powers*—and thus arrayed, as we suppose, first by Dr. Cullen, who probably imbibed the idea of *anti*-humoral pathology from Hoffman. These primary moving powers, assumed to be solid, may mean the brain, with the spinal cord, and the nerves proceeding from both ; the heart, with its arteries and veins ; and the lungs. When these words were first noticed, they had a powerful effect upon our mind, as going to prove a *new* pathology. But the doctrine has received no support, direct or collateral. Every attempt of this kind has but weakened the imposing sound of these words. For, we are to inquire, what is the brain divested of its fluids ; what are the nerves without their juice ; what is the heart robbed of its blood ; and what are the lungs without liquid air and liquid blood ? Without the aid of these humoral agents, the *primary moving powers* could not move at all. And if these words were meant to include the stomach, as a *primary moving power*, in the process of digestion, we well know that this process could not proceed without that important fluid, the gastric juice. We must therefore add to life, health, disease and death, *digestion* and *generation*, as all included and involved, past separation, in the humoral pathology.

The whole animal creation has its origin in fluid or humoral materials. Even the teeth and bones are depositions from fluids ; or, as we think, more properly to speak, are in reality secreted from the blood—for we must recollect that the *blood* is formed before the *bones*. It was once my lot to extract a molar tooth for a lad, of the first set, which had not lost any part of its roots. It came out *extremely* hard, another physician having failed in the attempt ; and I have often remarked since, that a *shedding* tooth came the hardest of any that I ever succeeded in extracting. Attached to the roots of this tooth was the embryo of a new one of the second set, in a soft gelatinous state. The absorbents, in this instance, had lost their power of removing any part of the old tooth, for it was sound, although extremely troublesome ; owing to the socket being crowded by the formation, or rather secretion, of the matter of a new tooth, into the same socket which still firmly held the old one. But it is the *fluidity of a tooth* which we would notice. The loss of the teeth and the loss of the hair depend upon the diminution and loss of circulation of those fluids which circulate in the capillary vessels, and which served to keep them in their places. Hence, the stump of a decayed tooth is easy to extract, because the little capillary vessels have lost those fluid matters which kept the stump adhering to the socket. Adhesion, therefore, is owing to pervious vessels reaching from one part to another.

Upon the proper rotundity of the eye, the goodness of the eyesight depends ; and its badness, upon the loss of those fluids which kept the ball of the eye in its proper shape, and form, and position. The shrinking of the intervertebral substance, by which the stature is diminished and the body bent, is occasioned by the loss of fluid matters, allowing that substance to collapse. It has been asserted that it is the *soul that sees* ;[*] but eagles see without souls, but not without those humors which help to form the eye. There has been, as we are told by **Dr. Good**, *speech* without the *tongue*; but never has there been *sight* without the *eye*.

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[*] By the Rev. Mr. Colton, in his Lacon ; and by Ezra Stiles Ely, D.D. of Philadelphia.

As the *anti*-humoral pathology was reared by the imposing sound of words, without much of detail or argument, it has been fostered in the same way. Uplifted spears, which have never struck a blow, have driven the humoral pathology from its strong hold. The history of its abnegation would form a curious trait in medical literature, and would serve to show what exclamation and derogatory denunciation can accomplish, unaided by facts, reasons, or arguments. To do away the force and effect of what certain medical opinions might have otherwise had, it has been sufficient to say that their author was "tinctured with the exploded humoral pathology." But it has been pertinently observed, that what is proved by a sneer is confuted by a sneer. We strongly incline to the opinion that there never has been any other pathology, than the humoral, established by solid facts and scientific reasoning.

There is one thing further, so directly connected with our present subject that we cannot omit its notice. **Haller**, who was a *solidist*, and whose pathology was based upon the *simple fibre*, held that emetics operated directly by irritating the fibres of the inner coat of the stomach. **Mr. John Hunter** was of a different opinion, and suspected that emetics acted only by, or after, absorption, and then by stimulating the muscles surrounding the stomach. And that he was correct, has been proved by **Majendie**, although at the expense of very cruel experiments. He produced retching and evacuation by the injection of an emetic substance into the veins of an animal. This *peering*, if not *peerless*, experimenter, sometimes obtains his knowledge by subjecting animals to tortures which we cannot approve; such as cutting out the stomach and attaching a bladder to the œsophagus and pylorus in its room.

It is a curious fact in our present medical history, that we know little or nothing of the doctrines, theory, or pathology, of the numerous professors in our medical colleges; and it is equally remarkable that the physicians of our hospitals, asylums, and retreats for the insane, publish so little of their pathology and practice. Indeed, they do not condescend to give the public their interesting, rare, and singular cases. But for the present, we submit our case without further evidence or comment.

The author of the numbers in your Journal, entitled **Medical Improvement**, I think, from their tenor, I know; and if the conjecture be correct, I highly esteem that writer as a most valuable and sincere and scientific friend. From him, so abundantly qualified, I should like to see a number upon the subject of Pathology; not knowing, however, that we have any ideas in common upon the present subject.

The writer feels it obligatory upon himself to notice the answers to his question respecting ergot, proposed some time past in your Journal; viz. *Does ergot lose its efficacy if kept over the year?* To this question satisfactory answers have been given by **Dr. E. Woodward** of Quincy, and by **Dr. Richard Hazeltine** of Lynn. In the name of the latter gentleman, although I never had the pleasure of his acquaintance, I recognize that of a writer in the first medical periodical ever established in the United States, and tender him the homage of my respects for his exertions in medical science, and for his kind though unmerited notice of me.

The query respecting ergot was not proposed from any experience of my own, that it loses its virtues by age. But a medical gentleman, of high standing in his profession, in consultation on a case where it became necessary to use it, made the unqualified assertion that it lost its efficacy and became inert if kept over the year. I did not think at the time to inquire upon what foundation this opinion rested, and have not since had an opportunity. The gentlemen above named have proved that the gentleman referred to was mistaken, and that it does not lose its power on the uterus if kept for *ten*, or even *sixteen* years.

November, 1833.

TWO CASES OF ABSCESS IN THE LUNGS FROM FOREIGN SUBSTANCES IN THE TRACHEA.

BY CHARLES HOOKER, M.D. NEW HAVEN, CONN.

[Communicated for the Boston Medical and Surgical Journal.]

CASES similar to the following have been recorded in various publications, but may be regarded as uncommon, serious, and therefore interesting.

CASE I.—A., a healthy boy two years of age, in February 1829, while engaged with several other children in eating walnuts, suddenly fell upon the floor in running across the room, and was immediately seized with a severe coughing, which continued incessant, almost to suffocation, for several hours, during which time the child had several turns of vomiting. I saw the child about two days after the accident, and from the appearance of the frequent, harassing, dry cough, it seemed evident that some foreign substance was in the trachea. At the time of falling on the floor the child had a quantity of the cracked nuts in its hand, and there was little reason to doubt that he inhaled some fragment of a shell. A consultation was held to consider the expediency of tracheotomy; but from the symptoms it seemed pretty evident that the foreign substance was not now in the larynx—and as its situation in the trachea could not be determined, the operation was thought unadvisable.

The cough progressed, with scarcely any mitigation, attended with a general febrile excitement, and, within about five days after the accident, the child complained of pain in the left side. The case was treated with opiates, frequent small doses of calomel, and, when the febrile excitement was considerable, with small doses of antimony. After a few days, percussion elicited an obscure sound in the region of the root of the left lung—this gradually extended, until the whole left side of the chest yielded a perfectly dull sound, the respiratory movements of the left parietes of the chest becoming scarcely observable, and the stethoscope detecting no respiratory sound on this side. In the course of four weeks the patient had frequent chills, and there appeared a general protrusion of the left intercostal spaces, but without any distinct pointing of the fluid, which was now evidently formed within the chest. The extremities became œdematous, and the patient seemed rapidly declining.

Within a little more than five weeks from the commencement of the illness, a great quantity of purulent matter was suddenly ejected by vomiting, and for the several succeeding days the alvine evacuations consisted principally of pus. A clear sound was now elicited by percussion, and *a distinct respiratory sound was audible with the stethoscope* over the whole left side.

The cough soon disappeared, and no symptom of thoracic disease remained, excepting a slight shortness and frequency of respiration, which was more especially observable after any severe exercise. This symptom, however, occasioned no serious inconvenience, and the boy became remarkably fleshy and robust.

In the summer of 1830, sixteen months subsequent to the above-mentioned occurrence, the boy was violently attacked with scarlatina, which produced a determination to the brain, and proved fatal on the sixth day.

On dissection, the whole left lung proved to have been destroyed by disease, excepting a roundish mass a little more than one inch in diameter at the root of the lung, which was enclosed with a firm smooth membrane covering the truncated terminations of the bronchiæ. To compensate for the loss of the left lung, the right lung seemed hypertrophied, and had crowded the mediastinum, with the heart, far to the left, so as to nearly fill the left half of the chest. A very thick firm cicatrix was observed in the left wall of the œsophagus, one or two inches below the root of the lungs, indicating the place where the pus formerly escaped from the left cavity of the thorax into the alimentary canal.

Case II.—G. N., a healthy infant boy, nine months old, was attacked with a severe dry irritative cough, in April 1833. This cough came on suddenly, while the child was playing with some green cedar boughs, some portion of which probably furnished the substance which entered the trachea. I first saw the child on the sixth day, when the existence of a foreign substance in the lower part of the trachea was unequivocally detected. With the stethoscope applied to the spine, over the root of the lungs, a circumscribed, distinct and loud hissing, whizzing or buzzing respiratory sound was heard, which varied from a simple hissing murmur, to a noise like that produced by the reed of a hautboy, according to the velocity of the passage of the air through the trachea. The foreign substance evidently appeared stationary, not ascending and descending with the respiratory movements, as occurs in some cases.

The case was left to nature, with simply an occasional opiate, to allay, as much as possible, the existing irritation. Within a few days a distinct crepitation indicated an incipient inflammation throughout the greater portion of the right lung, more especially about the root of the lung, the crepitating sound being most intense in the right interscapular region. By degrees the lung became so engorged that the respiratory sound entirely disappeared from the right side, the sound of percussion also being perfectly dull. During the progress of the inflammation, frequent small doses of calomel were given with the opium, which was administered in the form of laudanum, or Elixir Asthmat., combined occasionally with Tincture Sanguinaria. The inflammation, at two different times, kindled up in the left lung, but subsided under a more free use of the calomel and sanguinaria.

About three weeks from the attack, a fluctuating tumor appeared just behind the inferior angle of the right scapula. This tumor evidently communicated with the interior of the chest, and could be pressed entirely away; but, on removing the pressure, it would reappear during the next succeeding expiration, with a gurgling noise indicating the presence of both air and a fluid.

After consultation, the operation of *paracentesis thoracis* was performed. An external incision, about one inch in length, was made in the middle of the tumor, and with a lancet a puncture was made between the sixth and seventh ribs. About a pint of pus was discharged immediately after the operation, and the air in respiration passed freely in and out at the orifice. To prevent the air from entering the orifice, a finger was applied to it during inspiration, and removed during expiration; a large quantity of air mixed with pus was thus expelled from the orifice by each expiration. This process was continued for many minutes, rendering it evident that the abscess in the lungs communicated freely with the bronchiæ, for much more air was expelled from the orifice than could have existed in the cavity of the chest previous to the operation. After the purulent discharge ceased, a compress was applied to the orifice, with a bandage around the chest to prevent the air from entering the orifice in respiration. This was removed once or twice a day to permit the purulent matter to escape. At least half a pint of pus was discharged every day for several successive days, and did not entirely cease for several weeks.

Directly after the operation a respiratory sound was found to have returned to some regions of the right side—corresponding probably to portions of lung which had been simply *compressed* by the fluid in the chest. The action of the diseased lung continued gradually to improve; but even now, six months after the operation, the respiratory sound on that side has too much of the dry, whistling, or bronchial character, with but very little of the healthy vesicular murmur. Percussion too does not give a healthy sound; and a disparity between the respiration and the pulse (that is, a morbid frequency of the respiration as compared with the pulse, the healthy ratio between the frequency of the respiration and that of the pulse being as 1 to 4½) indicates a want of integrity in the lungs.

Remarks.—The two preceding cases may be regarded as instances of secondary irritation, and consequent inflammation and suppuration, of the lungs, caused primarily by irritation of the bronchial membrane. What ultimately became of the foreign substance in the trachea, in either of the cases, is uncertain. It is doubtful, however, whether it ever entered the tissue of the lungs. In the second case, it was certain that almost the whole right lung was affected with inflammation, while the foreign substance was still in the trachea.

A case somewhat similar to this I saw, with Dr. Knight of this city, in the summer of 1832. A considerable portion of one lung was solidified from inflammation, in consequence of a piece of filbert-shell in the trachea. There was reason to believe that in this case the filbert-shell never penetrated the lung, for it was eventually thrown up from the trachea in coughing.

In all such cases, if the stethoscope detects a whizzing sound in the larynx or upper part of the trachea, or if other symptoms indicate that the foreign body has not yet descended into the inferior part of the trachea, or the bronchiæ, there can be no question regarding the propriety of tracheotomy. On the contrary, if the foreign body has become fixed in the lower part of the trachea, or in a bronchia, the operation is commonly unsuccessful. In such cases the great indication is *to allay irritation*, for irritation is the primary cause of the inflammation, and the consequent destruction of lung, which ordinarily ensue. When inflammation arises, it is unquestionably proper to adopt some of the ordinary remedies for inflammation. Is there not, however, reason to apprehend that, in attending to the inflammatory symptoms, we commonly give too little attention to the primary irritation? And might not the serious results, to which such cases tend, be sometimes prevented by full doses of opium, and other ant-irritants, in the first stages? If the irritation were thus kept for a while at bay, either the foreign substance might insinuate itself to some region where it would cause less irritation, or from becoming accustomed to its presence, the part in which it is fixed would suffer less inconvenience.

In Case I., above related, being at the time but little accustomed to auscultation, I was led to suppose that a considerable portion of the left lung remained entire, after the purulent discharge from the chest, because a respiratory sound was audible on that side. This sound, as an experienced auscultator would readily apprehend, was unquestionably propagated from the right lung, through the air contained in the vacant left cavity of the chest—just as a respiratory sound may frequently be heard by applying the ear, or the stethoscope, to the abdomen, when the intestines are greatly distended with flatus.

In Case II. it is, perhaps, worthy of remark, that the air passed freely from the trachea into the abscess, and thence out at the orifice made by the operation; and yet no pus appeared to escape from the abscess into the trachea. Probably the communication between the trachea and the abscess was by a kind of valvular apparatus, which permitted a passage in only one direction.

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SIR CHARLES BELL.

This individual stands almost alone in his own country, and is scarcely rivalled in Europe, as an original discoverer in the science of physiology. From an article in a recent number of the Lancet, we obtain the following facts respecting his birth and the history of his life. John and Charles Bell, the former the author of the popular work on anatomy, which even now forms the most familiar manual in the hands of students in this country, were the sons of the Rev. John Bell, a presbyterian minister near Edinburgh. John, who was several years older than his brother, pursued the study of his profession with great ardor, and, as is well known, with success. He obtained a large share of practice both in Scotland and the sister kingdom, and was thus enabled to protect and to educate the younger members of the family. In this manner Charles Bell found himself from an early age under the superintendence of one who was well qualified both by abilities and inclination to watch in him the first dawnings of genius, and to aid the development of his peculiar powers. Having determined to bring him up to his own profession, John bestowed upon his brother every attention and care which could further his studies, and was rewarded by the most unremitting industry and assiduity on his part. Charles's progress in anatomy was unusually rapid, his manual skill being uncommonly great, and his dexterity as a limner enabling him to fix and retain all the knowledge which he acquired. Having completed his studies, he removed to London, with the intention of devoting himself exclusively to obstetrics; but after two years practice in this department, he quitted it for other branches more congenial to his inclination and talents. As an author, he first appeared before the public in his Surgical Anatomy, in which were displayed, in a style superior to anything which had previously been attempted, the several steps of the most important operations. Soon after this period Mr. Bell was associated in the Hunterian chair with Mr. Wilson, a man distinguished for his minute and accurate knowledge of descriptive anatomy. While thus engaged, Mr. Bell had abundant opportunity afforded him of completing his brother's work, which he did by the addition of a third volume on the anatomy of the brain and nervous system.

The rest of Mr. Bell's publications have principally had for their object the elucidation of that subject, in connection with which his name is now become so illustrious, the physiology of the brain and nervous system. His reputation as a practitioner has not been equal to that which he has enjoyed as an anatomist and a physiologist. As an operator he is adroit and successful, operating with peculiar calmness, and in lithotomy using the knife with celerity and discrimination. He was the first professor of physiology and surgery in the University of London, but the difficulties and disputes which arose in that institution induced him to resign, and his only professorship at present is that of comparative anatomy at the College of Surgeons. As a lecturer he has always been popular, joining to the attractions of voice and manner, great command of language, and uncommon fulness and propriety of illustration. The honor of Knighthood was conferred on Mr. Bell by his present Majesty, as it is said, at the earnest solicitation of the present Lord Chancellor, and the distinction has given general satisfaction.

Of the nature and amount of Sir Charles Bell's discoveries in the anatomy of the brain and nervous system, of the state in which he found this science, and of that to which he has brought it by his laborious investigations, we extract the following account, without alteration, from the paper referred to.

"Physiology for a long time was but a mere combination of fantastical hypotheses, arising out of an imperfect knowledge of chemistry, mechanics, and psychology. The labors of Glisson, Hoffman, and Haller, first gave it a new, positive, and experimental character, and established it on the analysis of the forces proper to each organic element. *Irritability*, the first example of a force proper to the organism, and discovered by Glisson, was a most important principle in the basis of the physiology of the eighteenth century. This was the commencement of that investigation of the powers belonging to each element, which was continued by Hoffman, and so much extended by Haller.

After this important detection relative to *irritability*, it became of consequence to determine its seat. Glisson, Gorter, and Hoffman, supposed it to be diffused throughout the entire organism; Haller, on the contrary, proved that it was confined to the *muscular fibre*. This was a fact of infinite value, as it formed the first link of that chain of precise *localizations* to which the progress of physiology is entirely due. Having shown that *irritability* belonged only to the muscles, Haller next proved that *sensibility* resided solely in the nerves. Here was, at once, a line of demarcation between *irritability* and *sensibility*—between *irritable parts* and *sensitive parts*—between *motion* and *sensation*. The two *chief properties*, the two *fundamental systems*, of the economy, namely, the *muscular* and the *nervous*, could no longer be confounded with each other.

In his great anxiety to establish this distinction, however, Haller overlooked the fact, that the *action of a nerve* was necessary to determine *the action of a muscle*, and that even in the nervous system itself, so vast and complicated, *sensibility*, properly so called, is not its sole distinctive attribute. Haller, as well as the physiologists who had gone before him, could only discover one identical and universally diffused property in the nervous system. He never suspected that there might be as many *distinct properties* as there are *distinct parts* in this system. It was reserved for our own times, to institute this new and more intimate analysis.

The nervous system may be considered as consisting of two principal divisions, viz. *the great nervous centres*, and the *nerves, properly so called.* Now it is worthy of remark, that these two divisions became respectively the subjects of experimental analysis nearly at the same time; for while Fleurens and Gall, in France, were endeavoring to localize the functions belonging to the divers points of the great nervous centres, Mr. Charles Bell was engaged in distinguishing and determining the functions peculiar to the different orders of the nerves themselves.

Here we have at one glance the entire progress of the science. Glisson discovers the *irritability* of, that is to say, the first example of a force really *proper* to, our organs. Haller localizes the *irritability* in the muscles, and the *sensibility* in the nerves, thus separating the action of the muscles from that of the nerves. Then comes the investigations of the divers functions of the nervous system itself—investigations, which, in France, were directed to the great nervous centres, and, in England, by Mr. Charles Bell, to the peripheric portions of this same system. He was the first to unravel the vast net-work of nerves, which penetrates, and gives life to all our organs. He was the first to attack the common error, till then prevailing, that all the different nerves had but one and the same property. He proved that each nerve had its *proper function*, each nervous filament its distinct property, and that thus, when two or more nerves, two or more nervous filaments, were distributed to an organ, it was not for the repetition or augmentation of the same function, but for its endowment with new functions and properties. The general result of the investigation of Sir C. Bell is, that, independently of the nerves of *smelling*, *hearing*, and *vision*, which, on account of their functions, have already been considered as distinct nerves, there are four grand orders or systems of nerves, differing essentially in their properties and functions from each other. They are classed as follows :—nerves of *sensation*, of *voluntary motion*, of *respiration*, and those of the great *sympathetic*. These different orders are sometimes separate, sometimes united, but in no case do they participate in the functions of each other. As we have already stated, whenever several of them are distributed to the same organ, it is always for the purpose of conferring the distinct properties and functions of the different orders of nerves thus distributed.

In order to entertain a just conception of Mr. Bell's method of disentangling the functions of different systems of nerves, it should be observed that what is commonly called a nerve, is far from being a *simple organ*. Each nerve is composed of a number of filaments, each of which has its peculiar action. Thus, one is for *sensation*, another for *voluntary motion*, and another for *respiration*. Hence it follows, that the nerve, considered in totality, does not represent a distinct organ, but an assemblage of nervous filaments, each possessing its peculiar and distinct function. If we examine a single nervous filament, that is, the *primitive and distinct* nerve, properly so called, it will be found to present a continuity of pulpy matter, from the point where it is sent off from the nervous centres, to its termination in the remote parts of the body ; and though combined or associated with others in its course, it, nevertheless, is always a *particular organ* in itself, possessing its own *proper functions*. That which, in the common acceptation of the term, constitutes a nerve, is merely a fasciculus of nervous filaments, having as many different functions as it contains nerves of different orders. This grand and masterly view, which predominates in the work of Sir Charles, is the key to all the new and remarkable results with which he has enriched the science of physiology.

In commanding this clue, Mr. Bell felt the importance of studying the roots of the nerves—that is to say, the points at which their filaments are distinct and isolated. With this view, he subjected to experiment each of those roots separately, when each of them furnished a distinct result. Thus, when an " entire nerve " was cut, a nerve of the spinal marrow for instance, sensation and motion were at once abolished in the part to which that nerve was distributed, simply because the nerve consisted of filaments of motion, and filaments of sensation ; but when one or the other of the roots of the nerve was cut separately, sensation or motion was separately abolished, because each root consisted of filaments which belonged exclusively to sensation or motion. In order to isolate sensation from motion, the experiment was not to be made on the nerve in totality, a complex organ, which consequently unites different functions, but on each particular root, for the root alone is the simple organ endowed with an unique function.

All the nerves, however, have not the same number of roots ; some have *two* roots, some have only *one*—and whether there be one or two, they are not always sent off from the same regions or columns of the nervous centres ; thus, all the nerves of the spinal marrow have *two roots*, one arising from the posterior, the other from the anterior, face of the chord.

Amongst the nerves of the brain, the fifth alone has a similar double anterior and posterior root ; all the rest have but one root, which is *anterior*, as in the 12th, 6th, and 3rd pairs,* or *lateral*, as in the 11th, 10th,

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* It has been already stated, that Sir C. Bell's work does not treat of the nerves of *vision*, *hearing*, and *smell*.

9th, and 4th pairs.[*] Here, then, is a natural arrangement of the nerves into three orders—those with a *double* anterior and *posterior root*; those with a single *anterior root*, or those with a single *lateral* root; and experiments have proved, that each of these three orders has a distinct function.

All the nerves which have a double anterior and posterior root, serve, at the same time, for *sensation* and *voluntary motion*; all those with a single anterior root, serve for *voluntary motion* only; and all those with a single *lateral* root, serve for *respiration* only.

But it is not in these grand divisions alone that the functions of the nerves are distinguished, for the *regions* or *columns* themselves of the spinal marrow and *medulla oblongata*, participate in the properties of the nerves which arise from them; thus, the posterior faces of the spinal marrow and medulla oblongata serve only for *sensation*, their anterior surfaces for *voluntary motion* only, and their lateral faces for *respiration* only.

There are, then, three *faces*, *fasciculi*, or *columns*, in the nervous centres, and according as the roots of the nerves are detached from one or other of these columns, and according as the nerves are composed of one or other of these roots, we perceive three distinct functions, viz. sensation, voluntary motion, and respiratory motion, or respiration.

Sir C. Bell's experiments show, that if, in a living animal, we touch the *posterior face* of the spinal marrow, the creature will give signs of suffering; if the *anterior face* be touched, it will not betray any sign of pain; if we cut the posterior root of one of the nerves arising from the spinal marrow, the animal loses sensation instantaneously in all the parts which the nerve supplied, whilst voluntary motion still exists in them; if, on the contrary, we cut the *anterior root*, voluntary motion is abolished, whilst sensation remains; and, finally, if, in a muscle which is supplied with nerves of voluntary motion, and nerves of respiratory motion, we cut the latter, the muscle will continue to act in obedience to the will, but will no longer take any share in the act of respiration. The inverse of this takes place, if we cut the nerves of voluntary motion.

Considering, then, in one view, the columns of the nervous centres from which the nerves arise, the *roots* by which they are sent off, and the *functions* peculiar to them, the nerves may be divided into three grand orders.

The first order comprehends *all the nerves of the spinal marrow, together with the fifth encephalic pair.* All these have a double root, anterior and posterior, and (what is remarkable with regard to them) the posterior root alone bears a *ganglion.* The posterior roots of all these nerves belong to sensation, the anterior to motion; and if one or other of these roots be separately cut, sensation or motion is separately abolished in the parts in which the divided nerve is distributed.

The second order includes the 12th, 6th, and 3rd pairs of the encephalic nerves. These nerves have but *one* root, which is anterior; they all appertain to voluntary motion exclusively, and when cut, the parts in which they are distributed are simply withdrawn from the power of the will.

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[*] In order to avoid confusion, it is necessary to state that Soemmering's classification is here adopted. According to this anatomist, there are twelve pairs of encephalic nerves, viz. 1st, *olfactory*; 2nd, *optic*; 3rd, *motor oculor. communis*; 4th, *pathetic*; 5th, *trigeminal*; 6th, *motor oculor. externus*; 7th, *portio dura*; 8th, *acoustic*; 9th, *glosso-pharyngeal*; 10th, *vagus*; 11th, *accessory*; 12th, *hypoglossal.* All the other nerves, consisting of thirty pairs, including the suboccipital, which is the first of this series, belong to the spinal marrow. The entire nervous system would include the *great sympathetic*, which is only spoken of incidentally in Sir C. Bell's work.

The third order embraces the 11th, 10th, 8th, 7th, and 4th encephalic pairs. All these nerves are sent off from the *lateral column* of the nervous centres. They belong exclusively to respiratory motion, and when cut, it is this motion alone which is abolished in the parts to which they are distributed.

A few examples will suffice to show some of the curious results of the investigations of Sir C. Bell.

Two principal nerves are distributed to the face—the fifth and seventh encephalic pairs. Now if, on a living animal, we cut the nerve of the fifth pair, the *sensibility* and voluntary motion are lost instantaneously, whilst the movements of the face which may properly be called *respiratory*, such, for instance, as the movements of the nostrils, still exist. If, on the contrary, the nerve of the seventh pair be cut, the *sensibility* and voluntary movements of the face exist, and the respiratory movements alone cease.

There are two muscles, which, in violent efforts at respiration, concur in elevating and enlarging the chest, the sterno-cleido-mastoid, and the trapezius. Besides the spinal nerves, of which these muscles receive branches in common with all the muscles of the trunk, there is a particular nerve, the *accessory*, which is distributed exclusively to them. This nerve takes a very singular route. It arises from the cervical region of the spinal marrow, and, on the *lateral* line, like all the *respiratory* nerves, it ascends into the cranium through the great occipital hole, coming forth again in company with the *par vagum*. Now if this nerve be cut in a living animal, the two muscles to which it is distributed, or such muscles as correspond with the sterno-cleido-mastoid and trapezius in the animal, lose the power of combining to raise the chest, though they still possess voluntary motion, which they derive from the spinal nerves.

The tongue receives as many as three distinct nerves, a branch of the fifth, the ninth, or *glosso-pharyngeal*, and twelfth, or great *hypoglossal*. From each of these it derives a *distinct faculty ; sensibility* from the fifth ; *voluntary motion* from the twelfth ; and *deglutition*, which appertains to respiratory motion, from the ninth.

It would be easy to multiply points of detail, but the grand facts with which Sir C. Bell has enriched science, demand consideration especially in an analysis. It is quite true, that a great many of the anatomical facts proclaimed in Mr. Bell's views had been known a long time. Monro had ascertained that the ganglions of the spinal nerves belonged to their posterior roots, and Santorini and Wrisberg showed that the fifth encephalic nerve had *two roots*, &c., but nothing was deduced from this knowledge.

In short, the importance of the discoveries of Sir Charles Bell cannot be too highly rated ; and had not the calls of a London practice, the duties of a hospital, and the estrangement from scientific habits which mars the usefulness of nine out of ten of our best surgeons, stood in the way, our discoverer (though we believe him to be one of those who least deserve the reproach) would not have left in the field of experiment even a gleaner's share for Majendie, by whom the distinctness of the functions of the anterior and posterior roots has been more fully developed. Although there may be some imperfections of detail resulting from the fact of Sir Charles having discontinued his investigations, and though he throws no light on the *great sympathetic*, nevertheless what he has done constitutes the most important advance that has ever been made towards analyzing the peculiar functions of the nerves; and his work not only possesses the rare merit of forming an epoch in the science, but justly entitles him to rank amongst the most distinguished physiologists of this or any other country."

EXTRACTS FROM THE PORTFOLIO OF A PHYSICIAN PRACTISING IN LONDON.

1. *Congenital Hypertrophy of the Liver.*—James Ambrose, three years of age, born of healthy parents, died at the Smallpox Hospital of smallpox, on the 9th of December, 1826. The pock was not of a bad sort, and I wondered what he died of. The abdomen felt large and full. On dissection, four ounces of water were found in the belly. The liver was ash-colored, *and of enormous size.* The thorax was quite healthy.

When the child was three months old, the mother noticed the swelling of the belly, and ascribed it to early weaning and the habit of sucking its thumb. The child eat heartily, and its general aspect and health were unimpaired up to the attack of smallpox; had no dyspeptic symptoms; had never emaciated. Stools very offensive, but not otherwise unhealthy. The child had never spoken, but was lively. The mother long ago made him a pair of stays to support the belly, and the child would often come to have the strings tightened or loosened. The disease was, in all probability, congenital.

2. *Baglivi on Cantharides.*—The opinions of this author on the application of blisters appear to me to possess infinite merit. He believes that the cantharides are absorbed into the blood, and there often do mischief by reason of a *sharp salt* which they contain, and which has a poisonous quality. Blisters may cause gangrene, especially in gangrenous states of the air. They are dangerous in disorders of the brain attended with ardent fever. Under such circumstances they may bring on convulsions. In all convulsive disorders attended with fever, avoid blistering. Blisters are bad in hot and dry constitutions; where there is great agitation and impetuosity of the blood; wherever fever runs high. Such as have been poxed are liable to suffer from blisters. Be very cautious with them in thin and spare habits. In such, they often cause startings of the tendons. They are improper in men of an adust or bilious temperament. They sometimes bring on a filthy satyriasis, and bloody urine. They are most dangerous in the summer season. They are hurtful in cases attended with delirium.

On the other hand, blisters are very good in a gross and viscid disposition of blood, tending to coagulation and stagnation. In fevers accompanied with a very low pulse, coldness in the extreme parts, and proneness to sleep—in the winter season—in moist constitutions, and fat habits, blisters are surprisingly beneficial. Oribasius first wrote on them. The Arabian physicians employed them largely in soporose and cold disorders. They are useful in pleurisy, after the fifth day. It is absurd to suppose that blisters applied in malignant fevers can draw out the venom. In diseases of the eyes and face, blisters applied to the nape of the neck are very serviceable.

Honey of roses is a good application to the ulcers left by blisters. Frankincense powder (Abietis resina) strewed upon an ulcerating blistered surface, does good. Lint dipped in alum water is also a good application; *but when the body is very foul, even these do but little service.*

Baglivi exhorts physicians to try cantharides in chronic obstructions of the viscera, seeing that such disorders often arise from a gross, coagulated, and stagnating blood, or from ropy disorders of the other humors.

[At St. George's Hospital, Dr. Seymour is now employing the tincture of cantharides in certain cases of dropsy with much benefit.]

In chronic coughs, and catarrhs accompanied with viscid expectoration, blisters to the *neck* are particularly serviceable.

3. *Excessive Intoxication.*—The following cases of excessive intoxication were communicated to me by my pupil (Mr. Hale) as having occurred under his own observation (June 18, 1823):—

Two sailors were brought on board ship, after drinking for two days. They continued in a state approaching to coma for five days, and ultimately recovered perfectly. They had insensibility, a kind of locked jaw, preventing all food or medicine from being taken, and a small but rather excited pulse; not very different, however, from the pulse of health.

Such cases are not uncommon in the navy, particularly after a ship has been paid off. The rule of practice is never to bleed them. Purge them; if possible, by internal medicines; if not, by enemata. Give them, occasionally, a tablespoonful of grog. The singularity consists in the great length of time that these symptoms will last, and the brain ultimately recover its functions perfectly.

Plica Polonica.—M. Sedillot, who has lately returned from a sojourn in Poland, communicated to the Anatomical Society of Paris the personal observations he had made on this singular disease. One of the hairs taken from a plaited mesh was subjected to a microscope; by means of which a median canal gradually enlarging towards the free extremity of the hair was clearly seen. This canal was lined with a most delicate reticulated tissue, and in this tissue was contained the coloring matter; the bulb was distended and softened, and drops of matter could be squeezed from it. The disease commences in the bulbs, and propagates itself towards the loose ends of the hairs. After a time, the diseased secretion becomes less and less, and finally ceases, and the hair returns to its normal state.—*Medico-Chirurgical Review.*

Open Foramen Ovale, without Cyanosis.—In a child of seven years, who had never had any symptoms of the blue disease, the inter-auricular septum presented at the site of the foramen ovale a network of fibres, between whose meshes the blood might freely pass.—*Ibid.*

Neuralgia.—A severe case of supra-orbital neuralgia is mentioned, in which quinine, combined with acetate of morphia, very speedily and decidedly effected a cure.—*Journal Complementaire.*

Amaurosis, from Onanism in a Female.—A prostitute was admitted into the ophthalmic wards of the Hôtel Dieu, with great weakness of sight, amounting almost to amaurosis. She confessed that she was in the habit of polluting herself, and that she was immediately seized with complete blindness, whenever she addicted herself to the practice. It is stated that unfortunately cases like the preceding are not very unfrequent among the young people of the seminaries and colleges in France!

Journal Hebdomadaire.

Dupuytren's Mode of treating Prolapsus of the Rectum.—This eminent surgeon has cured a vast number of patients laboring under this disease, by means of an operation which is both simple and speedily effectual. He seizes the folds around the anus with forceps whose blades are large and flat, and excises them with strong sharp scissors ; this excision must be carried deep enough to remove not only the integuments embraced by the forceps, but a portion of the rectum, when the relaxation of its mucous coat is very considerable ; generally the depth of the wound need not exceed a few lines, but in other cases it must be at least an inch. Dupuytren usually cuts off in this manner four folds of the margin of the anus, one in front, one behind, and then one on each side ; if the disease be not of great extent, the removal of one or two of the folds may be sufficient. This operation is seldom followed by any considerable hæmorrhage. It is necessary that the patient be so treated, that he has no occasion to have the bowels relieved for eight or nine days, in order that the wounds may not be disturbed. The cure is generally complete in a fortnight. Dupuytren has met with no case of failure hitherto.—*Journal Complementaire.*

Whole number of deaths in Boston for the week ending November 8, 24. Males, 9—Females, 15.
Of infantile, 4—canker, 1—old age, 4—consumption, 4—typhous fever, 4—croup, 2—intemperance, 1—throat distemper, 1—jaundice, 1—inflammation on the lungs, 1.

ADVERTISEMENTS.

MEDICAL SCHOOL OF MAINE.

THE MEDICAL LECTURES at BOWDOIN COLLEGE will commence on *Monday*, the 17th of February, 1834.

Theory and Practice of Physic, by JOHN DELAMATER, M.D.
Anatomy and Surgery, by REUBEN D. MUSSEY, M.D.
Obstetrics and Medical Jurisprudence, by JAMES M'KEEN, M.D.
Chemistry and Materia Medica, by PARKER CLEAVELAND, M.D.

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The amount of fees for admission to all the Lectures is $50. Graduating fee, including diploma, $10. There is no Matriculating nor Library fee. The Lectures continue three months.

Degrees are conferred at the close of the Lecture term in May, and at the following Commencement of the College in September.

Boarding may be obtained in the Commons Hall at a very reasonable price.

Brunswick, Oct. 7, 1833. (Oct. 30.—eop5t.) P. CLEAVELAND, *Secretary.*

DISSECTOR'S GUIDE.

JUST published by ALLEN & TICKNOR, *The Dissector's Guide, or Student's Companion* ; illustrated by wood cuts, clearly exhibiting and explaining the dissection of every part of the human body ; by Edward William Tuson, F.L.S., Member of the Royal College of Surgeons in London, &c. &c. First American edition, with additions ; by Winslow Lewis, Jr. M.D., Demonstrator of Anatomy to the Medical School at Harvard University.

A. & T. have just received a large supply of the standard Medical Books, which they will sell on the most reasonable terms—wholesale and retail. Their New Catalogue is now ready. Persons wishing, can have them by calling or sending to their store.

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Allen & Ticknor have for sale copies of the following works, at very reduced prices. United States Pharmacopœia, edition of 1828. Thacher's American Medical Biography. Bichat on Life and Death. Beclard's Additions to Bichat's Anatomy. *Oct.* 30, 1833. eop8w.

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